IN THE CLAIMS:

The status of each claim that has been introduced in the above-referenced application is identified in the ensuing listing of the claims. This listing of the claims replaces all previously submitted claims listings.

1. (Currently amended) An apparatus for performing a specific binding assay, the apparatus comprising:

a composite waveguide comprising:

a substrate comprising a first optical material of refractive index n_1 and having a first planar surface and an opposite second surface separated by a thickness and a surrounding edge, and

a waveguide film comprising a second optical material having a refractive index n_2 which is greater than refractive index n_1, said waveguide film disposed on said first planar surface of said substrate;

capture molecules, associated with said waveguide film, for interacting selectively with at least one type of selected analyte molecule;

a light source operably disposed to direct a light beam into said composite waveguide for propagation by total internal reflection therein; and

a light detection device positioned ~~in a cone of collection angles, said cone of collection angles having an axis oriented substantially orthogonal to a plane~~ to collect light emitted from a surface of said waveguide film.

2. (Previously presented) The apparatus of claim 1, wherein said light detection device is positioned to detect light passing through said opposite second surface of said substrate of said composite waveguide.

3. (Original) The apparatus of claim 1, further comprising an optical coupling element.

4. (Original) The apparatus of claim 3, wherein said optical coupling element comprises at least one prism that focuses light into said waveguide film.

5. (Original) The apparatus of claim 3, wherein said optical coupling element comprises a diffraction grating that diffracts light into said waveguide film.

6. (Original) The apparatus of claim 5, wherein said diffraction grating is formed into said waveguide film at an upper surface thereof, opposite said first planar surface of said substrate.

7. (Original) The apparatus of claim 5, wherein said diffraction grating is formed into at least one of said first planar surface of said substrate and a surface of said waveguide film adjacent to said first planar surface.

8. (Original) The apparatus of claim 3, wherein said optical coupling element comprises a waveguide coupler that directs light into said waveguide film by evanescent coupling.

9. (Original) The apparatus of claim 8, wherein said waveguide coupler further comprises an input waveguide and a precise spacing layer to evanescently couple light into said waveguide film across said precise spacing layer.

10. (Original) The apparatus of claim 9, wherein said waveguide coupler is disposed on an upper surface of said waveguide film, opposite said first planar surface of said substrate.

11. (Original) (Previously presented) The apparatus of claim 9, wherein said input waveguide comprises an optical material having a refractive index n_3 and a thickness of between about 0.5 mm and about 5 mm.

12. (Original) (Previously presented) The apparatus of claim 11, wherein said precise spacing layer comprises an optical material having a refractive index n_4, where $n_4 < n_2$ and $n_4 < n_3$, said precise spacing layer having a thickness selected to optimize evanescent coupling of light from said input waveguide into said waveguide film.

13. (Original) The apparatus of claim 1, wherein said substrate has a thickness of at least about 10 μm.

14. (Original) The apparatus of claim 1, wherein said waveguide film has a thickness of at least about 0.1 μm.

15. (Original) The apparatus of claim 1, wherein said first optical material comprises at least one of silicon dioxide, quartz, fused silica, silicon oxynitride, and magnesium fluoride.

16. (Original) The apparatus of claim 1, wherein said second optical material comprises at least one of silicon oxynitride and silicon dioxide.

17. (Original) The apparatus of claim 1, wherein said light source comprises a laser.

18. (Previously presented) The apparatus of claim 1, wherein said light detection device comprises a charge-coupled device.

19. (Original) The apparatus of claim 1, wherein said composite waveguide further comprises a sample reservoir configured to contain a sample solution adjacent to a surface of said waveguide film.

20. (Previously presented) The apparatus of claim 19, wherein said sample reservoir contains a sample solution comprising a plurality of molecules of a selected analyte and a

plurality of tracer molecules, said tracer molecules being activated by evanescent light escaping from said waveguide film into said sample solution.

21. (Original) The apparatus of claim 1, wherein said capture molecules are of a plurality of different types.

22. (Previously presented) The apparatus of claim 21, wherein said different types of said capture molecules are positioned at discrete locations from one another on a surface of said waveguide film.

23. (Original) The apparatus of claim 22, wherein said discrete locations are arranged in an array.

24. (Original) The apparatus of claim 21, wherein said different types of capture molecules are capable of reacting with at least two different analytes.

25. (Original) The apparatus of claim 21, wherein said different types of capture molecules are capable of reacting with at least four different analytes.

26-63 (Withdrawn)